Rational Expressions

1. For each question determine:
   a) the values of x for which the rational expression is equal to 0
   b) the values of x for which the expression is undefined

1. $\frac{(x-3)(x+2)}{(x-6)(x+1)}$ 2. $\frac{2x^2+3x+1}{x^2-9}$ 3. $\frac{x^2-25}{x^2+8x+15}$

2. Simplify the following expressions

1. $\frac{25x^3y^2}{15xy^4}$ 2. $\frac{3x^2-27}{4x-12}$ 3. $\frac{x^2-6x-27}{x^2-2x-15}$

4. $\frac{3x^2-10x+8}{3x^2-x-4}$ 5. $\frac{2x^2+11x+12}{x^3+x^2-12x}$

3. Multiplication and division

1. $\frac{3x^3}{2y^2}\cdot\frac{8y^4}{27x^2}$ 2. $\left(\frac{16x^3y^2}{25ab^5}\right)+\left(\frac{24xy^3}{15a^3b^2}\right)$ 3. $\frac{x^2-16}{x^2}\cdot\frac{x^2-4x}{x^2-x-12}$

4. $\frac{x^2-2x-35}{2x^3-3x^2}\cdot\frac{4x^3-9x}{7x-49}$ 5. $\frac{x^2-16}{x^2-10x+25}+\frac{3x-12}{x^2-3x-10}$

6. $\frac{x^3+4x}{x^2-16}+\frac{x^2+8x+15}{x^2+x-20}$ 7. $\frac{x^2-36}{x^2-8x+16}+\frac{3x-18}{x^2-x-12}$

4. Addition and subtraction

1. $\frac{3+x}{x}+\frac{4}{x}$ 2. $\frac{2x^2+5x-9}{x-5}+\frac{x^2-19x+4}{x-5}$ 3. $\frac{x-2}{x+3}+\frac{x+2}{x-4}$

4. $\frac{x^2}{x-5}+\frac{25}{5-x}$ 5. $\frac{x-2}{4x+8}-\frac{x+6}{5x+10}$ 6. $\frac{1}{2x}+\frac{5x}{x^2-1}+\frac{3}{x+1}$

7. $\frac{3x}{x^2-7x+10}-\frac{2x}{x^2-8x+15}$ 8. $\frac{3x-2}{x^2+2x-24}-\frac{x-3}{x^2-16}$

9. $\frac{2}{x+3}-\frac{x}{x-1}+\frac{x^2+2}{x^2+2x-3}$

5. Solving Equations:

1. $\frac{2}{5}+\frac{t}{4}=1$ 2. $\frac{x+1}{3}-\frac{x+2}{6}=\frac{x+5}{4}$

3. $\frac{x}{3}+\frac{x}{4}=\frac{7}{2}$ 4. $\frac{4}{x-5}+\frac{3}{x+5}=\frac{40}{x^2-25}$

5.. $\frac{5}{x-10}+\frac{2}{x-4}=\frac{9}{x^2-14x+40}$ 6. $\frac{5x}{x+1}+\frac{4}{x}=9$